MISSOURI DEPARTMENT OF NATURAL RESOURCES / Geological Survey and Resource Assessment Division

The Connection

A WELL DRILLING INDUSTRY NEWSLETTER

Volume 11 Fall 2002 Number 2

WELL DRILLING ADVISORY NEW HAVEN AREA FRANKLIN COUNTY

The Department of Natural Resources is issuing a well drilling advisory for the area in the vicinity of New Haven, Missouri. Tetrachloroethene (PCE) contamination has been detected in two separate plumes in the New Haven area. This advisory is being issued in cooperation with the Environmental Protection Agency Region VII (EPA) and the United States Geological Survey (USGS) to better protect public health and prevent the unnecessary spread of contamination through inadequately cased wells.

The northern plume in the New Haven area is in Section 36, Township 45N, Range 03W. This plume has already impacted several city wells, and extends below the surface down into the Roubidoux Formation more than 500 feet. The plume extends approximately 3000 feet south from the Missouri River. Concentrations of PCE in excess of 200 parts per billion (ppb) have been detected.

The southern plume is in Section 2, the north half of Section 11, the southwest quarter of Section 1 and the northwest ¼ of Section 12, all in Township 44N, Range 03W. This plume extends more than 4000 feet into unincorporated land south of New Haven. Available data suggests this plume is relatively shallow, limited to the Cotter Dolomite. The full extent of this plume may not be fully delineated yet.

To assure that new wells case out known contamination, all new wells drilled in the area should be constructed in accordance with the following standard:

Sec 36, Town 45, Range 3W:

Consult the division for construction specifications. Much of this area is currently served by public drinking water.

Sec 2, N ½ Sec 11, SW ¼ Sec 1 and NW ¼ Sec 12, Town 44, Range 3W:

Water Wells:

Recommended Casing:
200 feet
Recommended Grouting:
Full-length
Recommended Borehole Size:
10 inch

Heatpump Wells:

Recommended not to be constructed in area until plume is further delineated.

Construction using alternating plugs and fill has potential to spread contamination.

Contractors and homeowners could assume liability if contamination is spread.

More information will be presented in the upcoming winter issue of the *Connection* newsletter. If you have specific questions feel free to contact Evan Kifer at (573)368-2170.

INSIDE:

GPS REVIEW

In the last issue of the Connection, a discussion of the use of the Global Positioning System (GPS) for locating wells was presented.

GPS receivers are designed to track a specialized group of earth-orbiting GPS satellites. GPS receivers use advanced triangulation techniques to compute locations on the earth. Recently, an enhancement was added to GPS. "WAAS" is wide area augmentation system. It consists of ground stations that allow the GPS system to automatically correct distance variations due to "atmospherics" and thus attain 3 to 7 meter accuracy without fixed base post processing

Before a GPS receiver is purchased, its intended use and its specification should be researched. GPS manufacturers have stated that you should get a receiver with more capability than you think will be needed. Common

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FUTURE DATES OF WELL INSTALLATION BOARD MEETINGS

The next meeting of the Well Installation Board is tentatively set for Friday November 1, 2002, in the GSRAD Conference Room, 111 Fairground Road, Rolla, MO at 10:00 A.M.

The following quarterly meeting is tentatively set for Thursday February 27, 2003, at the Holiday Inn, Lake Ozark. This meeting will be held in conjunction with the Missouri Water Well Association Convention.

***GPS Review** continued...*

questions about individual receiver specifications include the following:

- What is the cost?
- Is it waterproof?
- How long do the batteries last?
- Are upgrades/additional software/internal maps available?
- How long does it take to configure or customize?
- Is it WAAS capable?

The following table shows a partial survey of GPS receivers available at local retailers or over the net at less than $200 (prices and other data are not guaranteed to be accurate). Also, a GPS watch is listed. Note that GPS units can be added to Palm and other personal desk assistants (PDA) but these are not presented. Most GPS users want a stand-alone unit with a computer interface; almost all of the units in the table have a computer port for downloading data.

Cost increases with:

- more accuracy,
- a receiver that has a large screen that can superimpose images such as street or topographic maps,
- other additional software or accessories.

Additional features and complexity require more time and training.

All GPS receivers locate the satellites as the first step of activation. This takes about 10 seconds (warm unit) to 3 minutes. Once the satellites are found, the GPS receiver location is illustrated. Wellhead would like the location data in degrees, minutes and seconds to be transcribed to the well report. For well location accuracy, the cheapest, simplest to use GPS unit with WAAS capability is sufficient. Discounts are available, especially with mass purchasing.

Name	Model	Water-proof	Battery	Warranty	Accuracy	WAAS	Add'n software	Cost (approximate)
Garmin	Etrex	Yes	2-AA 22 hrs		50 feet	No	No	115
	Etrex Legend	Yes	2-AA 14 hrs		<21 feet	Yes	Yes	180
Holux	EZ Way GM100				50 feet	No	No	130
Lowrance	Ifinder	Resist-ant	2-AA 12 hrs	1yr	<21 feet	Yes	Yes	199
Magellan	310	Yes/ Floats	2-AA 20 hrs	1yr	50 feet	No	No	100
	SporTrak	Yes/ Floats	2-AA 14 hrs	1yr	<21 feet	Yes	Yes	170
Standard Horizons	Magnum Nav-40	Yes	4 AA 50 hrs	3yr		Yes	No	165
Casio	Pathfinder Watch	Resist-ant	Lithium 40 days/ 1 hr GPS		50 feet	No	No	300

NOTICE

It is extremely important that all certification records, both well and pump, be filled out completely. When filling out your certification records, please provide as much information as possible. It is vital that you provide, among other information, the purpose of the well, the county where the well is located, the legal description, the site address and a proper mailing address. This information is necessary on every certification record. Due to the importance of this information, it will be necessary to send letters to contractors requesting missing information for all records that do not provide all of the above mentioned information. We thank you for your cooperation.

NEW PAGER NUMBER

If you've tried to page section staff and just couldn't get through, you are not alone. The Section recently changed pager services. The new number is 888-212-9038. Pager service can be utilized Monday through Friday, 5pm-10pm, and weekends 8am – 10pm.

Pager service was implemented to better serve the drilling community after normal business hours. We would appreciate it if correspondence relating to issues of a general nature, or issues that require researching files for information be made during normal business hours.

EDITOR'S NOTE

If you have any suggestions, ideas, or comments concerning this newsletter, please let us know.

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FORM AND FEE TRACKING PROCEDURE

The following procedure is used to track fees and forms when submitted by a contractor to Wellhead Protection:

1. The Division receptionist logs in checks received. She records the check name, check number and amount and then forwards records and log sheet to Wellhead's revenue clerk.
2. The revenue clerk verifies that the information has been logged correctly and reconciles with the documents received.
3. She then processes the daily deposit in which she writes the check name on deposit slip.
4. The clerk then enters the information into the revenue database. She enters the check name, check number, amount received and the source the fees are coded to, such as water well certification, monitoring well permit, penalty fees, etc.
5. At that point she prints the information and reconciles again with the log sheet and deposit slip.
6. If an overpayment is received, it is noted on the log sheet and also entered into the database. She will issue a credit letter to the contractor within 24 hours and file a copy.
7. Once the revenue is reconciled, the forms are distributed to the appropriate personnel and the check number is again entered into a database. Certification forms are entered into the Well Information Management System (WIMS) database and permitting forms are entered into the permitting database.

Wellhead Protection can track and locate a check that was submitted in a normal fashion very quickly. The check can be searched for by:

1. Checking the revenue database for the check number;
2. Searching by check name or check amount;
3. Pulling Wellhead log sheets and searching for the name and check number;
4. Checking the Wellhead WIMS database by check number or permit number to see what records a specific check number was applied to;
5. By going back to the Wellhead deposit slips and checking specific dates for the check name.

PLUGGING WELLS USING THE REVERSE TREMIE METHOD

Perhaps the simplest method of plugging a well is by filling the well from bottom to top with neat cement straight from the cement mixer. However, pouring cement through a large column of water, 100 feet or more, can cause the cement mixture to settle out in such a manner that it becomes porous in the upper portions of the water column. Therefore, it is required that a tremie pipe be used to place cement through a large column of water.

If the well you are wanting to plug has 100 feet or more of water, but you just want the cement mixer to back up to the well and fill it up so you don't have to mess with a tremie, then you may find the reverse tremie method to be the method for you.

Materials needed:

One 10 foot length of 2 inch diameter steel pipe
Black roll pipe
Clamps

1. Drill holes (1/4" or so) randomly up and down the length of the 2-inch diameter steel pipe. This will help keep the tremie assembly from floating up (which can be quite inconvenient when plugging a well located next to a busy highway. Pump installation contractor Lindell Lindsey and DNR staff member Paul Meyer can attest to this, after chasing 300 feet of roll pipe down the highway.)
2. Cut the bottom end of the pipe at a 45-degree angle, beginning about 2 inches from the bottom, and angling down to the bottom of the pipe. This will help keep the pipe from clogging up.
3. Securely clamp the length of roll pipe to the top end of the steel pipe (not the cut end). The length of the roll pipe should be about 20 feet longer than the depth of the well.
4. Place the pipe in the well, steel pipe first, until the steel pipe is about 10 feet from the bottom of the well. The length of roll pipe that extends out of the top of the well should be placed so that water coming out of it will be draining to the desired area.
5. **Slowly** pour neat cement into the well. The water that is being displaced by the cement will eventually begin flowing out of the roll pipe at the surface.
6. When the water coming out of the roll pipe turns gray, indicating the presence of cement in the water, cut off the roll pipe at or below the top of the casing and allow the pipe to sink into the well.
7. Continue **slowly** pouring neat cement until the well is filled. The cement may shrink quite a bit, so it is a good idea to come back the next day to top off the grout and proceed with the abandonment as directed in the Missouri Well Construction Rules.

2000 TOXIC RELEASE INVENTORY FOR WATER ANNOUNCED

According to the Toxic Release Inventory (TRI) of the EPA, approximately 284 million pounds of toxic chemicals were released into the nation's waters in the year 2000. This amount was 4 percent of the total amount of **7.1 billion pounds of toxics released to water, land and air.** The good news is that the EPA noted the total had dropped 48 percent since the first TRI in 1988. It should also be noted that the annual report reflects release

Toxic Release Inventory *continued...*

as well as waste-management activities such as the recycling of chemicals, landfilling or surface impoundments. The EPA maintains a search site on the Internet to check releases within a specific zip code. This site address is http://www.epa.gov/tri/index.htm

For Missouri during the reporting year 2000, 609 manufacturing and processing facilities reported releasing a total of **130,835,669 pounds of toxic chemicals to the environment in Missouri.** For the year 2000, the list of reportable chemicals included 576 individual chemicals and 28 chemical categories. It is important to note that a facility is required to submit a report for a listed toxic chemical only if the facility meets all three of the following criteria:

1. Employs the equivalent of 10 or more full time employees;
2. Is a covered industry, based on SIC (Standard Industrial Classification) code, or is a federal facility; and,
3. Manufactures or processes more than 25,000 pounds, or otherwise uses more than 10,000 pounds of a listed toxic chemical during the course of the calendar year.

The 2000 reporting year is also the first year that facilities began reporting for a category of chemicals known as PBT's, or "persistent, bioaccumulative and toxic" chemicals. These are a class of chemicals that are highly toxic, bioaccumulate in animal tissue and persist in the environment for long periods of time. Examples of these types of chemicals are mercury and mercury compounds, certain organic chemicals such as hexachlorobenzene or octachlorostyrene, pesticides such as chlordane and methoxychlor, and dioxin and dioxin-like compounds. The reporting thresholds for these chemicals were reduced to between 10 and 100 pounds depending on their toxicity. In Missouri, companies reported releasing a total of 12,224.2 pounds of PBT chemicals for the reporting year 2000. Releases of dioxin and dioxin-like releases totaled 36.105 grams (one gram equals 0.002205 pounds).

There are also numerous other sources not covered under the TRI that release toxic chemicals. These sources include motor vehicles, agricultural operations and small businesses. To fully understand what the numbers mean, a look at the full report is needed as there is more information required than an article of this length can fully explore. In cooperation with the EPA, The Missouri Department of Natural Resources provides a *State of Missouri Toxics Release Inventory Summary Report – 2000 Data*. This report represents the most current data available for the release and management of toxic chemicals by Missouri manufacturing and processing facilities. Copies of this report have been sent to approximately 250 libraries throughout the state. The report may also be accessed on the Internet at http://www.dnr.state.mo.us/oac/mo00tri.pdf If you cannot access the report through one of these sources, a paper copy of the report can be ordered from:

The Missouri Department of Natural Resources
Outreach and Assistance Center
Document Distribution Services
P.O. Box 176
Jefferson City, MO 65102-0176

If you have questions or need more information concerning the state report, or have general questions about the Toxics Release Inventory, please contact Gene Nickel of the department's Environmental Assistance Office at 1-800-361-4827 or (573) 526-6627.

THANKS

A hearty thank you to **W.F. Schnell and Sons Drilling** for allowing a DNR staff person to spend several days with the drilling crew. Experience is indeed the best teacher.

GROUNDWATER SECURITY

Over the last year security has become a major issue in most industries. Water Security has not been left out. Recently, while reviewing items of interest in the *Water Well Journal*, we came across the following article printed by the National Ground Water Association:

With water wells providing the daily water source for 52 percent of the U.S. population, residential well owners need to know that the water they pump into their homes is safe.

The following is information that should provide answers to questions regarding water security.

Should I be concerned about the threat of terrorism to my water supply?

Individual household water wells are not considered likely targets of acts of terrorism for several reasons.

The first is that groundwater is a poor target for terrorists because the ground protects it to some degree. Sometimes water from wells is hundreds of feet below the surface. Groundwater also generally moves slowly through the soil, which doubles as a filter, and can remove some biological and chemical agents.

Chemical agents considered a likely source for terrorists would not work well if dumped on the ground near a properly constructed and maintained well.

Finally, household wells are not considered major targets because of affecting limited numbers of people is not seen as an effective terrorist tactic.

How can I best protect my private water supply?

The No. 1 thing to do is to get your well tested regularly, no matter if there is a threat of terrorism.

Keep records to document your water quality over time. If you notice any change in taste, color, or odor, have your water tested as soon as possible.

continued next page...

Is there anything else I can do to safeguard my well system?

Know your water system. Inspect the wellhead for signs of damage or tampering. Periodically, check the well cap on top of the casing to ensure it is secure. Also be aware of the area around the well, and inspect it for changes. If you have concerns about the age or condition of your well, contact a qualified water well contractor.

Are there water treatment devices that can protect my water supply from terrorist threats?

NSF International, which develops standards, product testing procedures, and certification services for water treatment devices, has not yet tested any residential water treatment devices to determine effectiveness against commonly named biological agents employed by terrorists, namely anthrax, cholera, plague, salmonella, or smallpox. For future development, check with your local professional groundwater contractor.

What can I do if there is a terrorist act against an electrical provider?

The loss of electricity needed to operate the pump on your well is probably the greatest vulnerability of your well system. However planning ahead can alleviate problems associated with a loss of power.

A water storage tank could be added to your well system. A typical 120-gallon tank — enough to maintain a family of four for one day — can easily be installed by a professional water well contractor.

Small portable gas or diesel-powered electricity generators are available that can operate the pump, or full-system generators that will run your well, refrigeration, heating, cooling, and other systems in your home can keep your well operating in an emergency.

Will boiling my water help in an emergency?

Boiling water is effective in removing certain contaminants, but is not the answer for everything. In fact, boiling water that contains lead and nitrate will increase their concentration and potential risk. It is best to check with a local health department to determine if boiling water is necessary.

Where can I find more information about the safety of my water well supply?

Contact your local contractor if you have any immediate questions. Also, go to the Web site of the National Ground Water Association, www.ngwa.org, or its Web site created just for well owners: www.wellowner.org. ♦

WELLHEAD PROTECTION SECTION PHONE NUMBER LISTING (573)368-2165

BOB ARCHER
Section Chief
(573)368-2165 Information on legislation and enforcement. Monitoring Well Construction.

EVAN KIFER
Unit Chief—Hydrogeologic Investigation Unit
(573)368-2170 Field investigation, variances, casing depths, shallow injection well (Class V) construction standards, oil and gas well permitting.

NEOMIA ROBINSON
Unit Chief—Administrative Unit
(573)368-2174 Provides technical assistance in the area of regulations, well certification and enforcement procedures.

SHARON BEISTEL
(573)368-2168 Water well construction information and certification, location of wells and map reading information.

SHERI FRY
(573)368-2115 Permitting and testing information. Provides technical assistance in the area of regulations, well certification and enforcement procedures. Oil & Gas Council Secretary.

MARY JO HORN
(573)368-2375 General information, requests for forms, county maps, and publications.

JEANNIE HOYLE
(573) 368-2450 - Well Installation Board Secretary and information regarding Notices of Violation (NOVs).

PAUL MEYER
(573)368-2159 Water well reconstruction and heat pump registration. Well plugging and field investigation.

KATHRYN (KAY) HARRIS
(573)368-2165 Section Secretary—General information, requests for forms, county maps, publications, invoicing and fee questions.

MATT PARKER
(573)368-2196 Confined animal feeding operation wells, casing depth information, variances, field investigation. Certification of monitoring wells.

JOE SCHLUETER
(573)368-2316 Abandonment registration, well plugging and field investigation.

VACANT
(573)368-2195
Oil and gas well permitting, oil and gas production statistics, shallow injection well (Class V) construction standards.

PEGGY WENDT
(573)368-2318 - Correspondence Clerk, information regarding pump information records submitted, and drought assistance well certification letters.

CATHY SMITH
(573)368-2167
Casing depth information, variances on well construction and field investigation. Certification of monitoring wells. ♦

WELCOME

A-1 Pump Co\Brian Huffman
Ahrens Contracting\Jeff Haudrich
Anthony Schulte Water Well Systems\Marvin Schulte
Copeland\J W Copeland
Custom Well & Pump\Teddy Moman
D B & Sons\Don Blansestt
Douglas Pump Service\Thomas Vigil, Billy Lee Perry
Entrix Inc\Eddie Stanaland
Environmental Strategies Inc\David Liverseed
Feth Pump Service\Ralph Feth
Harriss Drilling Services\James Rowton
Iberia Well Drilling & Pump Service\Melanie Wilson
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Klingner & Associates\Lance Schuette
Lakefront Heating & Cooling\Tobias Mantonya
Micah Group\Mark Stafford
Mid-America Environmental Services\Adam Vogt, John Slayton
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Parsons Group\Todd Trometer
Prosonic\Jerry Beardmore
Raimonde Drilling\Angelo Raimonde
Randolph Pump\John Randolph
Southwest MO Well Drilling\Russell Morton
Summers Well Drilling\David Summers
Terracon\Rand Raglin
Tetra Tech Inc\Benjamin Wolfe
The Water Boys\Mark Hunsaker
TRC Environmental\John Simpson
The Water Boys\Tamara Slentz, Daniel Crume, Tod Davis
Tiff City Pump\David Hardesty
TSI Engineering\Rick Whitney, Robert Skrivan
Wideman Well Drilling\Stevie Crawford

FAREWELL

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ATC Associates\Cynthia Cash
Bral Environmental\Christopher Locke
Burns & McDonnell\Grant Smith
Buttram Pump Service\Herbert Buttram
Cape Environmental\Michael Richardson
Dillard Drilling\Barbara Dillard
Earth Tech\Russell Henning
ELM Consulting\Randall Overton
Feeler Service Co\Norman Feeler
Foster Well Drilling\Jeff Stewart
Gawedzinski/Michael Gawedzinski
Groundwater Service & Supply\Michael Seale
Herst & Associates\Barry Power, William Kipp, Elizabeth Reed
Hewitt Well Drilling\David Green
IT Corp\Heather Smith
Jettons HVAC\Raymond Jetton
Kingston Environmental\Chad Tipton, Royce Face
Matthews\Sabrena Matthews
Miller Drilling\Darren Penn
Natural Resource Consultants\Patrice Boehler
P C & E Consulting\Frederick Westemeyer
Reynolds INC\Michael Burton, Ronald Alexander
Rock Port Plumbing\Steve Lininger, Alan Lininger
SCI Engineering\Steven Michael Grace
Shepard Well Drilling\Joseph Mounce
Sitex Environmental\Nick SanDiego
URS Corporation\Thomas Adams, Angela Eckhoff, Jeffrey Fisher, Daryl Poduska, Brian Linnan,
Versar\William Louis
W Carlton Stewart & Associates\W Carlton Stewart

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